

# **FISCAL IMPACT ANALYSIS**

**SEQUEL No.1**  
***Environment &***  
***Transportation***

second

annual

## **GROWTH POLICY**

report  
of  
the

MONTGOMERY  
COUNTY  
PLANNING  
BOARD

october  
1975

The Maryland-National Capital Park and Planning Commission is a bi-county agency created by the General Assembly of Maryland in 1927. The Commission's geographic authority extends to the great majority of Montgomery and Prince George's Counties: the Metropolitan District (for parks) comprises 919 square miles in the two counties, while the Regional District (for planning) includes 1001 square miles.

The Commission has three major functions: (1) the preparation, adoption, and from time to time, amendment or extension of the General Plan for the physical development of the Maryland-Washington Regional District; (2) the acquisition, development, operation, and maintenance of a public park system in the Maryland-Washington Metropolitan District; and (3) in Prince George's County, the operation of the entire County public recreation program.

The Commission operates in each County through a Planning Board, appointed by and responsible to the County Council. All local plans, recommendations on zoning amendments, administration of subdivision regulations, and general administration of parks are responsibilities of the Planning Boards.

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**FISCAL**  
*IMPACT ANALYSIS*

**TITLE:** FISCAL IMPACT ANALYSIS, SEQUEL NO. 1, Environment and Transportation, Second Annual Growth Policy Report of the Montgomery County Planning Board.

**AUTHOR:** The Montgomery County Planning Board of the Maryland-National Capital Park and Planning Commission

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**DATE:** October 1975

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**ABSTRACT:** The report describes the results of some in-depth studies of two functional components of urban growth - transportation and water-sewage treatment. Proposals are presented for a balanced transit-highway system that will adequately maintain a desired level of service, and for reducing the size of additional treatment plant capacity to fit projected growth trends more closely. New techniques for measuring the level of service, especially for bus and rail transit, are described. Cost estimates are included, and related to the previous "base-case" fiscal analysis published September 1975. Relationships to the total growth management process in the County are identified, and further steps in the process outlined.

## INTRODUCTION

On September 8, the Planning Board transmitted to the Council its Second Annual Growth Policy Report: Fiscal Impact Analysis. In our scheduling discussions with the Council last spring, the Board also agreed to deliver a follow-up report on October 6th, to illustrate the way in which the material and techniques of the first report could be put to practical application by the Council. The following material summarizes our findings to date in this regard, and recommends some specific policy actions.

Because of the complex and continuous nature of growth policy making, these recommendations do not exhaust the range of subject areas that should be addressed, nor the range of alternatives that could be explored. With the understanding and agreement of the Council, we propose to expand the number and depth of further analytic presentations in the months ahead, and look forward to discussing your interests in these matters when we meet in worksession on this topic on October 17.

## FISCAL IMPACT ANALYSIS - THE BASE CASE

In the Fiscal Impact Analysis, we pointed out that the Board could now provide a tested and operational planning tool with which to assess the fiscal impact of alternative growth strategies, and the fiscal impact of alternative capital investment and operating programs. We noted that the numbers produced in our report were based on a set of assumptions about future public costs and revenues; and that, while we thought all the assumptions used were "reasonable" and "accurate" for the purposes of establishing a "benchmark" or "base case," they nevertheless were open to substitution, as the Council desired, to test the effects of other alternatives.

Since publication of the base-case report the Planning Board and its staff have evaluated its findings in greater detail, and reached the following conclusions with respect to their

interpretation. While not changing any of the substance of the conclusions on pages 30-36 of the base-case report, the following statements perhaps should be read in their place, as providing a more concise and coherent version than the original.

### 1. Increase in Tax Rates

No matter what growth rate occurs over the next ten years, the implementation of current capital investment and operating projections will result in a substantial increase in tax rates. While we have not evaluated the operating cost projections of the various agencies, as contained in last year's PSP, against comparative expenditure indices from the past or from other jurisdictions, we suspect that they are not too high, especially when such additional costs, as are outlined further in this report, are added to the base-case analysis. Also, while we have not subjected all our revenue projections to an in-depth feasibility study, we think they are as high as is reasonable, since they essentially are based on the assumption that new development will have market values very similar to the market values reflected by current development in the County. To expect much higher than this would seem to go counter to current trends towards diversifying the economic mix of the County. Consequently, this troublesome aspect of our fiscal future should be of first concern in thinking about the relationship of growth and fiscal policies.

### 2. The Need to Focus on the Sub-elements of Total Growth

Using the property tax rate as the benchmark, the fiscal impact of all three County growth rates is virtually identical by the end of the decade. A slightly greater difference occurs if the per capita cost to taxpayers is used.<sup>1/</sup>

<u>1985 Property Tax Rate</u>	<u>Increase in taxes per capita (1976-85)</u>
1/ High Growth Rate = \$4.73	\$113.88
Trend Growth Rate = \$4.84	\$124.36
Low Growth Rate = \$4.85	\$134.10

This surprising result suggests that, within the assumptions of this report, the rate of growth alone, as a single variable, exercises very little leverage on the tax rate. This does not mean that the rate of growth is insignificant. It does mean that we must look below the surface of the growth rate concept in order to identify the component elements that do exercise leverage.

### 3. The High Leverage of Operating Costs on Tax Rates

There are three major reasons for this absence of fiscal impact due to growth rate: (1) The amount of growth and public services that are added in ten years, even under the high growth rate assumption, is still relatively marginal with respect to the base of established growth and public services that already exist.<sup>2/</sup> (2) The base case did not assume any great shifts in the economic character of the new development, by comparison with the economic character of existing development, nor in the new levels of public service expenditure, by comparison with the existing levels of public service expenditure. (3) By far the greatest proportion of the annual tax dollar goes to operating expenses (92%), rather than to debt service for capital expenses (8%); and operating expenses, because they are generated largely by "person" services which are relatively insensitive to "economies of scale," tend to vary in direct proportion to the total population requiring service. Thus, operating costs offer a much more fruitful area of investigation for potential cost reductions than do capital costs. Accordingly, the Council should intensify its review of the operating budget, and insist on the development of a public services program that analyzes cost projections in a manner that allows better management and better fiscal planning.

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		Population Increase 1975-85 as % of 1985 Total Population
<u>2/</u> eg. High Growth Rate	=	26%
Trend Growth Rate	=	20%
Low Growth Rate	=	8%

#### 4. The Need to Link Operating Costs to Capital Costs to Levels of Public Service

However, we must also recognize that commitment to capital costs implies some kind of commitment to future operating costs; and capital costs are sensitive to some economies of scale, especially with respect to convenient location, and with respect to timing of construction vis-a-vis demand, two important aspects of growth. Hence, the development of better analytic measures of the relationships between capital and operating costs is critical to the County's ability to gauge its future prospects accurately. These relationships in turn are keyed to the concept of "level of public service," for which some objective measures must be developed if the full impact of alternative fiscal scenarios on the quality of life for County residents is to be evaluated. In this report, we have applied this conclusion to two fiscal sub-systems of the County: water-sewer and transportation.

#### 5. The Apparent Fiscal Benefits of "Clustering" Growth

The base-case analysis of the effects of "clustering" a larger amount of new development either up-county or down-county (Alternatives #2 and #3) showed that, in general, this "clustering" of new development produced a net fiscal benefit by comparison with the more even spread of new development into both areas, as reflected in the Trend Rate (Alternative #1). The down-county weight was considerably more efficient over the first five years of the decade than the up-county weight, which showed virtually no advantage over the Trend distribution by 1980.<sup>3/</sup> However, by 1985, the up-county weight had begun to show a similar effect, although not quite closing the gap.<sup>4/</sup>

3/ 1980 Property Tax Rate - Trend Rate (#1) = \$4.14  
1980 Property Tax Rate - Trend Down County (#2) = \$4.03  
1980 Property Tax Rate - Trend Up County (#3) = \$4.13

4/ 1985 Property Tax Rate - Trend Rate (#1) = \$4.84  
1985 Property Tax Rate - Trend Down County (#2) = \$4.55  
1985 Property Tax Rate - Trend Up County (#3) = \$4.63

In general, this effect seems due to the fact that, between 1980 and 1985, costs outpace revenues to a greater extent in the Up-County Alternative (particularly school costs) than they do in the Down-County Alternative; whereas by 1985 this difference has become less distinct. Consequently, it seems appropriate to draw the conclusion that, from a fiscal perspective only, there would be some advantage, in the short run, to a down-county emphasis. It must be noted however, that neither the Down-County nor the Up-County Weights could be achieved in their entirety, <sup>5/</sup> and neither are likely to be achieved, even partially, without stronger growth management tools (such as preferential sewer allocation and preferential tax treatment) than are presently in effect.

5/ Both of these were projected as alternatives to test the fiscal impact of the ends of the "clustering" spectrum, not as assessments of what new growth management tools could accomplish. If the latter were desired, further studies and actions will be required.

## THE PURPOSE OF THIS REPORT

In our September report we referred to the opportunity offered by this fiscal impact tool for the Council and Board to undertake a series of "what if?" analyses. At the briefing of the Council on September 12, several suggestions were mentioned as possible candidates for this "what if?" process. We have not had time to deal with any of those particular suggestions in this report, but are prepared to do so in whatever sequence the Council may wish, provided that we can mesh the work effort with the rest of the planning program. We will have some suggestions about how we might most usefully explore some of these questions.

This report summarizes our findings with respect to additional studies, beyond the base-case fiscal analysis, that we have undertaken over the past five or six months in the two important functional areas of Water-Sewer and Transportation. Both are important to both growth and fiscal policy. We have also included some observations on population-employment forecasting, which may help keep some issues in better perspective. In several of these studies, our staff have had to push the "state of the art" beyond its present boundaries, and, in a few cases, literally "invent the wheel" in order to generate enough data or to provide an analytical framework to connect capital costs to operating costs to level of public service. We expect to provide a full documentation of this work, so that we and the Council can use it for future reference and to improve upon it for future analysis. But, because the technical analysis is complex, it will require time to prepare the full written description and necessary graphics. In the meantime, this report presents the major findings as we see them today, and our staff will provide a verbal presentation and graphic displays of some of the back-up material when we meet on October 17. We also hope that this report illustrates what might be done in other areas of fiscal impact analysis to provide a much sharper focus on policy choices.

Briefly summarized, we find that the County's growth can be adequately served for the next 10 years by a 30 mgd sewage treatment plant instead of the proposed 60 mgd AWT. Similarly

an 80 mgd water filtration plant expansion instead of 160 mgd, will adequately serve County growth. Building the smaller increments also appears to be more prudent fiscal policy.

We find that an adequate level of transit service, including deficits for an efficient bus system and for metrorail, will probably cost about \$13.4 million per year--a sum greater than currently programmed. Also, just to approach adequate levels of service on major roadways will require at least four times the current State expenditure for highways in the County, as well as increases in the County's budget for traffic management and road operations.

In some cases, some of our findings are disturbing, as they challenge previously accepted policies, assumptions or preferences. Not all members of the Board are fully comfortable with all that the analysis reveals. We all feel, however, that if it is to be of any value to the Council, we must present it in a straight-forward manner and let the chips fall where they may.

#### POPULATION-EMPLOYMENT FORECASTING

The base-case fiscal analysis examined three alternative ten year growth forecasts, labelled High, Trend, and Low. They were intentionally labelled as "assumptions," to underscore that they were selected to test the fiscal impact of a conceivable "range" of expectations about growth. The question of which exact growth rate within this range will actually come to pass requires a different, but complimentary, kind of analysis.

Population-employment forecasting is not an exact science. It is particularly influenced by major shifts in human behavior patterns, such as those currently affecting family size, birth rates, and migration patterns. Forecasters must make assumptions about such trends, and take constant readings of actual changes, as in the decennial census, or the recent census update which we conducted, in order to correct those assumptions for future

forecasts. Last fall, the Planning Board, in its Annual Ten Year Household and Employment Forecast, recommended the figure of an average of 16,000 persons per year as the current "best guess" to use for planning purposes over the next ten years. Based on studies since that time, we have revised this slightly downward to an average of 15,000 persons per year for the Trend Growth Rate used in the base-case fiscal analysis.

At the present time, we still feel that this Trend rate, and its distribution throughout the County as reflected in the base-case report, is the most reasonable 10 year forecast to use for planning purposes. However, we are aware of various short and long term trends and indicators from different sources, that suggest the possibility that in the next year or so, we may shift to an even lower growth rate. These include such things as surveys of the short term mortgage money situation, changes in the rate and direction of rural to metropolitan migration patterns, surveys of trends in Federal employment in this region, and the long term consequences of energy shortages.

In order to examine this possibility, our staff has produced what we call an Intermediate Forecast that lies between the Low Rate and the Trend Rate in the base-case report (ie 9,000 persons per year). Although not included in this present report, we intend to use this Intermediate Rate for the purpose of bracketing, as the "most probable" range of growth, the range between this new Intermediate Forecast and the previously established Trend Forecast. Thus, although we do not feel that there is sufficient justification at present to change the Trend Forecast as our official "best guess," we nevertheless believe that it is prudent to recognize the possibility of a shift occurring to a lower growth rate that may lie somewhere between the Trend and the Intermediate. If such a shift takes place in fact, we shall have to make further adjustments in fiscal policy.

Because it is generally recognized that employment is the driver of growth, especially with respect to migration patterns, and since it is very difficult to forecast employment without

knowledge about the regional economy and its relationship to the Nation, our staff has been investing considerable time and effort in seeking to develop a Cooperative Forecasting process through the Council of Governments. The COG Board of Directors has approved the agreement reached among the planning directors of the region for a joint effort by the staffs of the jurisdictional planning agencies, the Council of Governments, the National Capital Planning Commission, the Washington Center for Metropolitan Studies, and the National Planning Association to produce, by January 1976, a "most probable" statistical projection of future Federal employment in this region, and from this to project a similar estimate for non-Federal employment, and from this an estimate of total regional population.

If successful, this process will give us for the first time a more accurate fix on what kind of growth pressures may be generated on Montgomery County by the employment forces at work in the metropolitan region. Therefore, we are hopeful that before the time the Council must make final decisions on next year's capital and operating programs, there will be available a somewhat more comprehensive assessment of which growth rate is most probable in the real world. In the meantime, we have used the Trend Forecast for our present work, with the idea in mind that, if anything, it may need to be adjusted downward.

#### ENVIRONMENTAL SUB-SYSTEM ANALYSES

In this section we will concentrate on treatment facilities for sewage and water, with some reference to air quality. The open space aspect of environmental concerns is being studied in our current Master Plan of Parks, Recreation and Open Space, due for delivery to Council by next June; and we are currently preparing a Public Services Program for the park system which will deal with the fiscal implications of the next six years. Stormwater is addressed in our Seneca and Muddy Branch Watershed Conservation Plan, which is due for delivery to the Council in early November; with other plans to come later in our program.

Various other environmental concerns such as solid waste and noise are being addressed through other, separate activities.

### Sewerage System

The base-case fiscal report carried water and sewer under the sub-system heading of the Washington Suburban Sanitary Commission, because its revenues come primarily from user charges rather than taxes. The report noted that capital costs for sewerage systems had relatively little fiscal impact on the County because of the high proportion of the cost (85%) that is normally funded through State and Federal subsidy grants; but that the opposite is true for water supply systems, because nearly all of these costs must be borne by the County directly.

In spite of the relatively small leverage of sewerage capital costs, we have examined the relationship between the level of demand that would be generated by the three alternative growth rates and the cost to the County of providing the sewer facilities projected by the adopted capital programs of WSSC, because of the importance of such facilities to growth policy. Figure 1 shows this relationship with respect to sewage treatment capacity. The three solid lines labelled #5, #1, and #4 show the projected demand (average daily flow) in millions of gallons per day for the High, Trend, and Low Growth rates respectively.<sup>6/</sup> The dotted lines show the total sewage treatment capacity that will become available to the County as the proposed interim treatment plants come on line, and as the proposed 60 mgd. AWT plant opens in 1980 in accordance with its official WSSC schedule. The total capacity after 1980 has made allowance for the removal of the interim plants when the AWT opens.

It is clear from the chart that, even under the High Growth Alternative, there will be adequate sewage capacity between now and 1980, if the interim plants are constructed as proposed; and that there will be a considerable degree of

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<sup>6/</sup> Alternatives #2 and #3, the down-county and up-county weights, generate the same flow as the Trend Rate.

Figure 1  
SEWAGE TREATMENT CAPACITY  
and  
PROJECTED FLOW

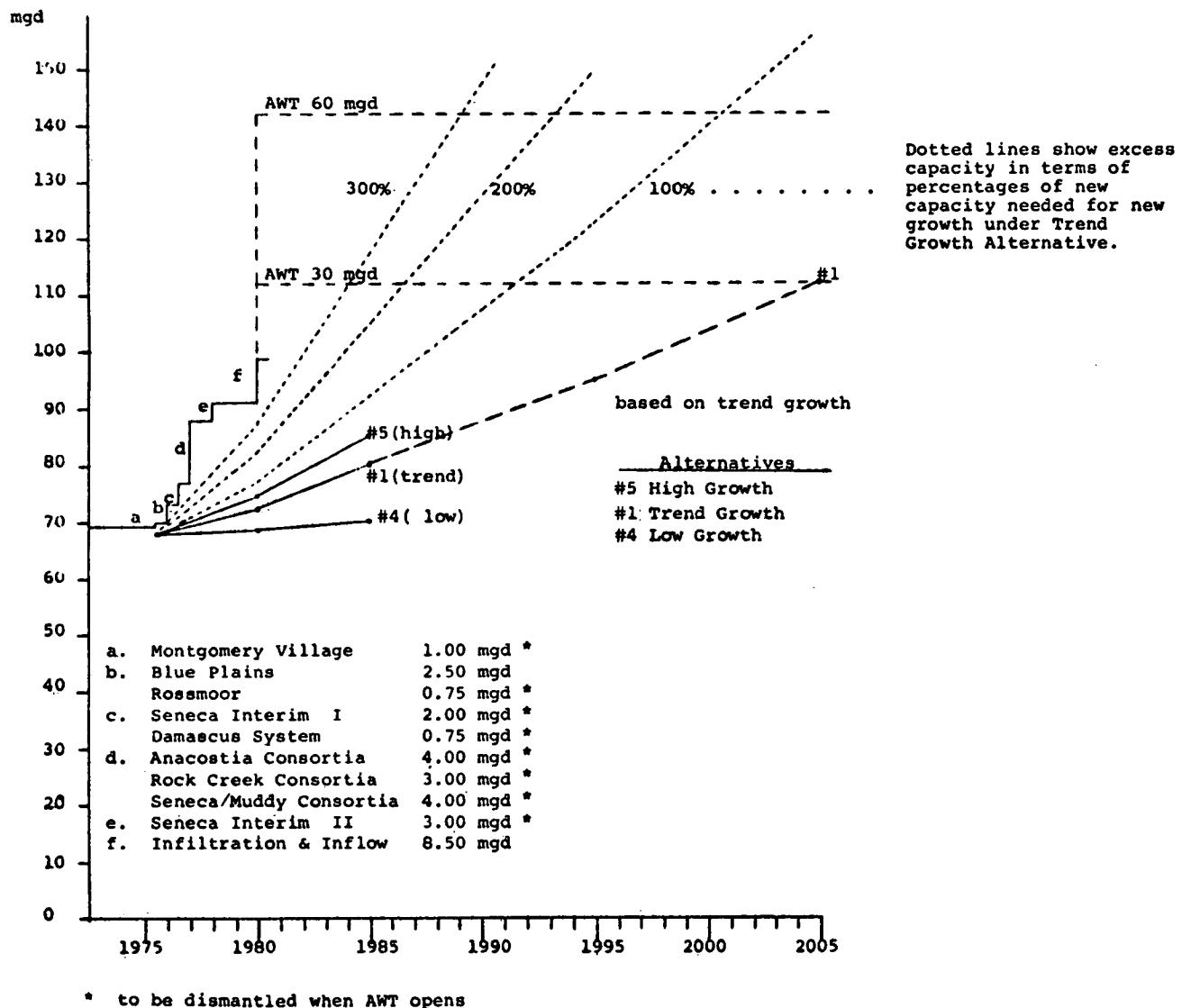


Table 1

AWT PLANT

<u>Capital Requirements (\$000)</u>	<u>FY76</u>	<u>FY77</u>	<u>FY78</u>	<u>FY79</u>	<u>FY80</u>	<u>FY81</u>	<u>FY82</u>	<u>FY83</u>	<u>FY84</u>	<u>FT85</u>
<b>Total WSSC</b>										
AWT 60 mgd:	1,447	10,750	10,125	1,687	0	0	0	0	0	0
AWT 30 mgd:	920	6,837	6,440	1,073	0	0	0	0	0	0
<b>Montgomery Co. Share</b>										
AWT 60 mgd:	680	5,049	4,756	792	0	0	0	0	0	0
AWT 30 mgd:	432	3,211	3,025	504	0	0	0	0	0	0
<b>Savings:</b>	<b>248</b>	<b>1,838</b>	<b>1,731</b>	<b>288</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b><u>Debt Service (\$000)</u></b>										
<b>Montgomery Co. Share</b>										
AWT 60 mgd:	55	460	841	905	905	905	905	905	905	905
AWT 30 mgd:	35	293	535	576	576	576	576	576	576	576
<b>Savings:</b>	<b>20</b>	<b>167</b>	<b>306</b>	<b>329</b>						

excess capacity after 1980, generated by the addition of the 60 mgd AWT, if the AWT is constructed as proposed. Figure #1 has added some dotted lines that are above, and roughly parallel to, the Trend Growth Rate line (#1). These lines show where various levels of excess capacity would fall, expressed in terms of percentages of the amount of capacity required by the new development contained in the Trend Forecast. From this, we can see that, under present schedules, there will be an excess of capacity over-demand in late 1979 of about 400%, and thereafter as high as 700-800% in the early 1980's.

We present this chart to allow the Council to make a judgment as to what degree of "cushion" is best in terms of excess capacity. Some degree of "cushion" obviously is necessary in order to permit WSSC to service the lead time requirements of developers, and to allow for developers to exercise a variety of choice options among locations. The latter notion goes to the economic concept of the need for a certain degree of excess supply opportunity in order to avoid monopolistic conditions and to allow the market mechanisms to work with respect to the pricing of new dwelling units and structures. Although we are not aware of any firm economic theory on this matter that could be applied to this case, and although we recognize that the relationship of price to scarce resources may often be a matter of psychological perception, we think that a firm public commitment to a capacity level above 100% of the amount needed to service projected growth ought to be sufficient to allay this concern.

Further discussion about the appropriate amount of cushion may be desirable, but we have concluded, on the basis of this examination, that the anticipated orderly growth of the County would not suffer if the AWT were cut from 60 mgd. to 30 mgd. in its initial stage, and possibly even delayed for a few years after 1980. A second stage addition of another 30 mgd. around 1990 would keep the 100% cushion open, and could save a significant amount of County debt service in the interim.

Table 1 shows the difference in annual total capital requirements and annual County debt service under the two options of

maintaining the present proposal for a 60 mgd. plant in 1980 versus reducing it to a 30 mgd. plant in 1980. It shows an annual savings of \$329,000, that would begin to accrue to Montgomery County in 1977 and 1978 and that would be constant thereafter for twenty years, (the assumed life of the bonds) or until it became necessary to expand the plant before then. Although this saving would accrue to the citizens of the County in the form of lower WSSC charges, it nevertheless should be considered as a means of making funds available for other, possibly higher priority, capital facilities that would require funding through tax revenue.

In addition, there are such considerations as the possibility, mentioned above, that the actual growth rate may prove to be somewhat less than the Trend Rate used here. In that situation, debt service for the unneeded capacity would be carried for many years by too few taxpayers, resulting in higher sewer rates than necessary. Also, the reduced size would be prudent from the Federal and State funding perspective. And from an environmental viewpoint, the technology of sewage treatment is undergoing rapid development; so that delaying the second increment might result in substantial improvements in technology by the time it is actually needed. There may be, however, competing pressures to build the larger size plant in order to supply some of the needs of other jurisdictions in the region. Council may wish to address this issue, as we have reached our conclusion on the basis of the fiscal impact on Montgomery County alone.

On the basis of these considerations, we recommend that the Council ask the County Executive, as part of the Ten Year Water and Sewerage Plan amendment process, and ask the WSSC, as part of its Capital Programming process, to prepare a short feasibility report, describing what disadvantages would accrue to the County if the AWT plant were cut back to 30 mgd. in its first phase, with a second 30 mgd. programmed for a second phase about 1990. Unless this report demonstrates clear disadvantages, we recommend that this cost saving action be initiated by the Council

### Water Supply System

This section focuses on the proposed Potomac Filtration Plant expansion, a facility that is intended to serve both Montgomery and Prince George's Counties. The following discussion focuses on with the Montgomery County share of the size and cost of this facility.

Figure 2 shows a comparison between the projected water supply demand (under the Trend Growth Rate for Montgomery County plus the projected growth rate for Prince George's Countie's) and the proposed available water treatment plant capacity, (including the programmed 1981 expansion of the Potomac Filtration plant by 160 mgd.). The line labelled "Design Day Projections" is based on present and projected water consumption behavior patterns. The line below, labelled "10% Reduction" illustrates the lower demand that would result if the WSSC's proposed Water Savings Program could produce a 10% reduction through changing behavior patterns.

From this chart it seems apparent that, like the AWT situation, savings could be generated by decreasing the size of the filtration plant addition, and adding a second stage later. We have shown the effect of a possible reduction of phase one from 160 mgd. to 80 mgd., and the addition of the second 80 mgd. phase about 1990. Table #2 shows Montgomery County's share of the savings that would accrue from this action, which would amount to almost \$2,000,000 per year by 1979 and would continue through the life of the twenty-year bonds or until it became necessary to expand the plant before then. Because of the absence of State and Federal funding for water supply, the fiscal impact on the County of postponing half of the proposed water supply expenditure is much greater than the impact of postponing half of the proposed sewage treatment expenditure.

Although it is clear that there are regional problems of inadequate water supply storage facilities needed to surmount bad drought conditions, and that it looks as if we will actually need to achieve about a 5% reduction in demand under

Figure 2  
WATER FLOW (DESIGN DAY PROJECTIONS)  
and  
TREATMENT CAPACITY

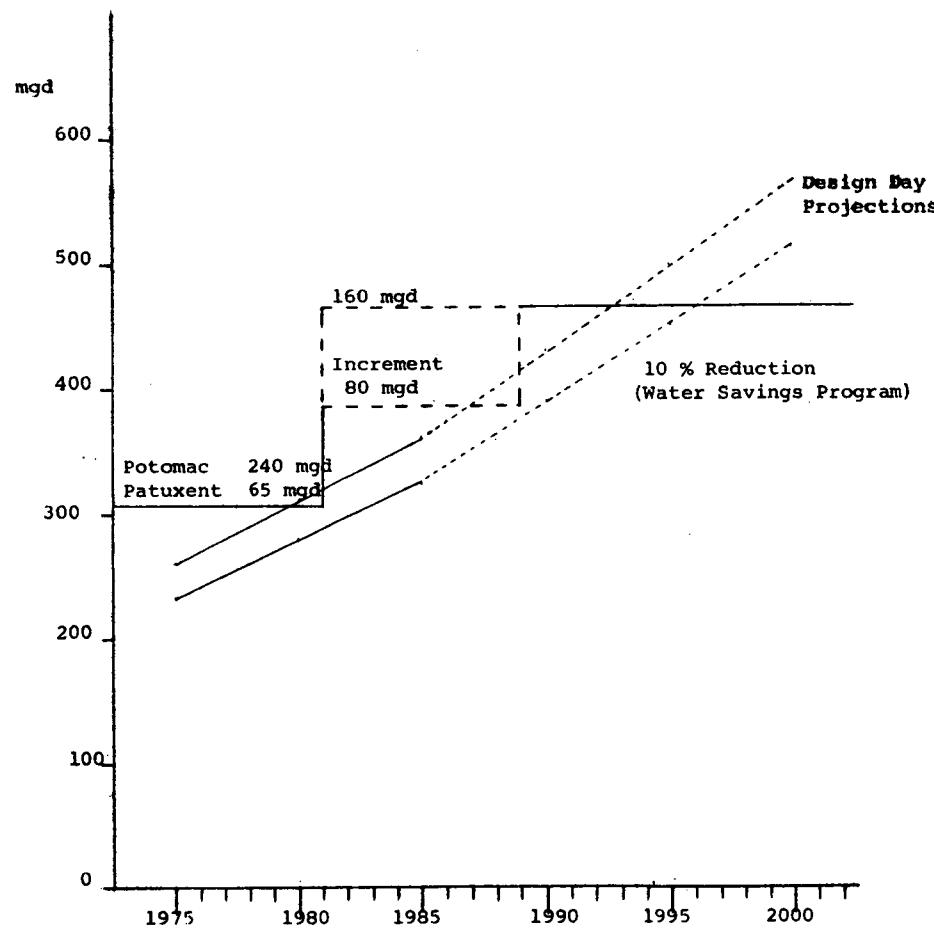


Table #2

POTOMAC FILTRATION PLANT

<u>Capital Requirements (\$000)</u>	<u>FY76</u>	<u>FY77</u>	<u>FY78</u>	<u>FY79</u>	<u>FY80</u>	<u>FY81</u>	<u>FY82</u>	<u>FY83</u>	<u>FY84</u>	<u>FY85</u>
<b>Total WSSC</b>										
Plant, 160 mgd:	3,380	36,620	32,000	29,200	4,000	0	0	0	0	0
Plant, 80 mgd:	1,690	18,310	16,000	14,600	2,000	0	0	0	0	0
<b>Montgomery Co. Share</b>										
Plant, 160 mgd:	1,588	17,200	15,030	13,715	1,879	0	0	0	0	0
Plant, 80 mgd:	794	8,600	7,515	6,857	939	0	0	0	0	0
<b>Savings:</b>	<b>794</b>	<b>8,600</b>	<b>7,515</b>	<b>6,858</b>	<b>940</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Debt Service (\$000)</b>										
<b>Montgomery Co. Share</b>										
Plant, 160 mgd:	127	1,508	2,713	3,814	3,965	3,965	3,965	3,965	3,965	3,965
Plant, 80 mgd:	64	754	1,357	1,907	1,983	1,983	1,983	1,983	1,983	1,983
<b>Savings:</b>	<b>63</b>	<b>754</b>	<b>1,356</b>	<b>1,907</b>	<b>1,982</b>	<b>1,982</b>	<b>1,982</b>	<b>1,982</b>	<b>1,982</b>	<b>1,982</b>

the water savings program between now and 1981 when the Potomac plant expansion is ready, we conclude that a postponement of half of the proposed expansion would be a prudent fiscal move and appears to have no major disadvantages. If other counties, such as Howard and Anne Arundel, require water from this facility it might be desirable to build it larger, but in that case they should defray the extra cost.

Accordingly, we recommend that the Council ask the County Executive, as part of the Ten Year Water and Sewer Plan amendment process, and ask the WSSC, as part of its Capital Programming process, to prepare a short feasibility report, describing what disadvantages would accrue to the County if the Potomac Filtration Plant addition were cut back to 80 mgd. in its first phase, with a second 80 mgd. programmed for a second phase about 1990. Unless this report demonstrates clear disadvantages, we recommend that this cost saving action be initiated by the Council.

#### Air Quality

In last year's growth policy report, Framework for Action, we said that the state of the art for air quality measurement and projection was inadequate for precise use in growth policy decision-making. We believe that this conclusion still holds, although we are now closer to being able to bring it into focus, by virtue of the investment made over the past year in learning more about this technology.

Last year we said that the Federal Environmental Protection Agency was revising its regulations, and that the major pollution problems of this region stemmed primarily from automobile exhausts rather than from smokestacks. Unfortunately this statement remains true a year later, with the Federal guidelines never having "jelled" during the interim. By action of Congress, the complex source standards and parking management regulations that had been scheduled to come into effect on July 1, 1975, were postponed indefinitely; and it is still not clear what standards and deadlines will be imposed on the automobile

manufacturers with regard to auto emission controls. We will comment further on this at the end of this report.

Our staff have conducted several interagency work sessions, and attended many others, for the purpose of keeping abreast of this problem. We have concluded that the state of the art, with respect to the photochemical oxidant effect that comes from the action of ultra-violet light in the upper air on mingled auto exhausts, is not sufficient to allow us to model it in a reliable way for land use regulation purposes. Hence, we have concentrated on dealing with another major pollutant, carbon monoxide. By investing in a consultant study, we have now acquired a methodology for modeling the effects of this pollutant at the micro-scale, and are preparing to apply this technology to the apparent "hot spots" of the Rockville Pike in North Bethesda, where our transportation analyses lead us to suspect that serious congestion problems may develop which in turn will generate high carbon monoxide concentrations, and where the study's results can be used in the development of sector plans. Hot spots of carbon monoxide tend to diffuse, or decay, down to background levels within about 150 feet from the source, and appear to be susceptible to localized design variations, such as height and shape of buildings, vehicle management, volume control, etc.

We expect to have a report on this test case ready by February 1976. Between now and then we will continue to try and push the frontiers of this technology forward so that it can be brought to bear on macro-scale growth policy. One general observation may be made that, from the perspective of air pollution alone, a low growth rate creates the least adverse impact in the short run. This is obvious and axiomatic, because auto emission control standards are not yet fully in effect and the transit system is not yet available. Until these two can further reduce the pollution

created by automobile travel, all growth tends to worsen the air pollution problem somewhat. The question is, how critical are the magnitudes? We will return to this question after examining the transportation issues.

## TRANSPORTATION SUB-SYSTEM ANALYSIS

### Introduction

The base-case fiscal report allocated certain capital and operating costs to the Transportation Sub-system in accordance with the general methodology of the base-case analysis. That is, the assumption was made that the amount of money shown for transportation projects in the adopted six year capital program and public service program (and equivalent sources for State expenditures) would be spent as scheduled, and that, with some internal variations, an equivalent per capita amount would continue to be spent each year during the period beyond the six year program to the end of decade. The net effect of this was that transportation costs in the base-case were constant for all growth rate alternatives for the period 1976-81 but varied generally in proportion to the alternative population growth rate assumptions for the period 1982-85.

The resultant total transportation expenditures for the two periods 1976-81 and 1982-86 are shown in Tables #3 and #4 for County expenditures; and Table #5 for State highway expenditures. Not shown are State or Federal subsidies for Metrorail. State highway expenditures are shown for comparison purposes, but were not included in the calculations of County costs leading to the tax rate conclusions of the base case.

It is important to note that, although the base case analysis provides an appropriate measure of the effect of projecting into the future today's official estimates of levels of expenditure, it does not speak to the issue of what level of service will be provided by this expenditure. Also, it does not take into account the recent new estimates of increased costs for Metrorail and Metrobus. The base case assumed for Metrorail capital cost only the Adopted Regional System total estimate of \$2.98 billion, approved by the jurisdictions in 1969 and reflected in the County CIP as Montgomery County's share of this total under the existing regional agreements. Also, the base case assumed that there would be no operating deficit from Metrorail,

TABLE #3  
COUNTY CIP EXPENDITURES  
FROM ALL FUNDING SOURCES

	CIP FY 76-81		ALT 1 FY 82-86		ALT 2 FY 82-86		ALT 3 FY 82-86		ALT 4 FY 82-86		ALT 5 FY 82-86	
	\$ (x1000)	%	\$ (x1000)	%	\$ (x1000)	%	\$ (x1000)	%	\$ (x1000)	%	\$ (x1000)	%
Streets & Highways	69,133 (52,177)	33	65,524	47	65,524	47	65,524	47	60,388	44	68,511	48
Bus & Commuter Rail	3,409 (1,129)	2	3,231	2	3,231	2	3,231	2	2,978	2	3,378	2
Bikeways & Pedestrian Facilities	6,661 (6,001)	3	6,313	5	6,313	5	6,313	5	5,818	5	6,601	5
METRO	130,845 (721)	62	64,422	46	64,422	46	64,422	46	64,422	49	64,422	45
<b>TOTAL</b>	<b>210,048</b> <b>(60,028)</b>	<b>100</b>	<b>139,490</b>	<b>100</b>	<b>139,490</b>	<b>100</b>	<b>139,490</b>	<b>100</b>	<b>133,606</b>	<b>100</b>	<b>142,912</b>	<b>100</b>

Note: Numbers in parentheses are County Bond Expenditures

TABLE #4  
COUNTY PSP EXPENDITURES  
FROM ALL FUNDING SOURCES

	PSP FY 76-81 \$ (x1000)	ALT 1 FY 82-86 \$ (x1000)	ALT 2 FY 82-86 \$ (x1000)	ALT 3 FY 82-86 \$ (x1000)	ALT 4 FY 82-86 \$ (x1000)	ALT 5 FY 82-86 \$ (x1000)
Minor Road Projects Maintenance, & Adminis- tration	69,801 (69,801)	58,750	58,750	58,750	58,750	58,750
Project TRIP	21,516 (21,516)	0 <sup>7/</sup>				
METRO	87,976 (51,565)	109,293	109,293	109,293	109,293	109,293
TOTAL	179,293 (142,882)	168,043	168,043	168,043	168,043	168,043

Note: Numbers in parentheses are County Expenditures

<sup>7/</sup> No expenditures are allocated to Project TRIP for the period FY 82-86 because completion of Metro in the early 1980s will require complete restructuring of the County's bus services.

TABLE #5  
STATE 5-YEAR HIGHWAY IMPROVEMENT PROGRAM EXPENDITURES

	PROGRAM FY 76-80	ALT 1 FY 81-86	ALT 2 FY 81-86	ALT 3 FY 81-86	ALT 4 FY 81-86	ALT 5 FY 81-86
	\$ (x1000)	\$ (x1000)	\$ (x1000)	\$ (x1000)	\$ (x1000)	\$ (x1000)
HIGHWAYS	45,975	62,429	62,429	62,429	56,089	66,054

STATE HIGHWAY OPERATING EXPENDITURES

	ALT 1 FY 76-86	ALT 2 FY 76-86	ALT 3 FY 76-86	ALT 4 FY 76-86	ALT 5 FY 76-86
	\$ (x1000)				
MINOR PROJECTS, MAINTENANCE, & ADMINISTRATION	48,267	48,267	48,267	46,437	49,293

and that the County contribution to bus operating costs would extend beyond the six years in a manner proportionate to the amount contained in the six year PSP.

For these reasons, it became apparent to the Board that the Transportation Sub-System is the one major expenditure area of the base-case analysis that may be significantly under-estimated, both with respect to the validity of the estimates of project costs that are in the CIP and PSP, and with respect to whether the level of service implied by these projects will be acceptable to the public. Because of the importance of transportation service to all aspects of growth, and because of the current regional discussions about transit costs, we have concentrated a good deal of effort into an attempt to create a new understanding of the relationship between levels of expenditure and levels of public service as it applies to transportation.

We expect that the analysis outlined below, together with the technical report that will follow later, will serve as the basic framework for an updated Master Plan of Transportation for the County; and we will continue to flesh out this framework with further detail and staging considerations. In the meantime, we recommend that the Council, after evaluation, transmit this analysis to the County Executive with the request that he make reference in the forthcoming CIP and PSP to the relationship between this analysis and his transportation proposals, and that he clearly outline in these documents a comprehensive relationship between the capital costs of the transportation projects and their necessary operating costs. We further suggest that the Council may also wish to make use of this analysis as a reference document and benchmark tool for judging the policy implications of the next CIP and PSP recommendations on transportation.

## Methodology

In order to get a grasp on the full implications of the transportation problem, it is necessary to first of all have in hand a technical tool with which to measure levels of service. This yardstick may then be applied to both the present and projected future distribution of people and jobs, and an estimate made of the changes needed in the highway and transit networks, in order to achieve whatever level of service is deemed to be adequate. Once this network design hypothesis has been created, it can then be costed out and the resultant need for public expenditure translated into tax rates.

In the case of highways, an accepted technique for measuring levels of service has been developed over the last twenty-five years, expressed in terms of traffic levels ranging from "A" at the "good" end of the spectrum to "F" at the "bad" end of the spectrum. The break point between level "D" and level "E" has generally been accepted in Montgomery County as the minimum level of service acceptable as policy. Our staff were able to take this technique, and, by inventing a method of aggregating a set of traffic count data and from this determining judgmentally whether various major roadways were above or below our policy level "D," were able to evaluate the distribution of highway service levels over the County for the next ten years. 8/

For transit service, however, a similar basic measurement technique has not yet been produced; perhaps because of the long historical emphasis on the automobile as the major agent of urban transportation, with transit as a private, profit-making business. In any event, it has been necessary

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8/It should be emphasized that this is a macro-scale study and not a computerized traffic simulation; and therefore is not route specific with regard to detailed traffic volumes and turning movements.

for our staff to invent an entire methodology in order to begin this exercise. Although it was done under considerable time pressure, and may need some subsequent refinement, we believe it is basically sound and should constitute a significant contribution to the state of the art of transportation planning. Using this technique, the transit level of service "needs" of various sub-areas of the County were evaluated for the next ten years.

From these two evaluations, both of which assumed the Trend Growth Rate, it was then possible to create a "best fit" design hypothesis for both a highway system and a bus system. Metrorail, commuter rail, and bike path systems were also included. For roads, this meant the identification of critical projects needed to meet the highway travel needs of the next decade. For transit, it meant for the first time developing an outline of a comprehensive County-wide bus transportation system capable of serving the needs of today as well as the future.

From this design concept, we were then able to estimate the costs necessary to provide the needed new facilities. In this way, the cost projection is not just a linear extrapolation of present expenditure levels without reference to levels of service; it is a policy sensitive analysis of what it will cost to approach adequate levels of service. In this way, the analysis gets at the issue of quality of life insofar as the transportation function is concerned, and makes possible the translation of the equation into fiscal terms.

Total costs were then broken down into County versus State or Federal costs, and the County's share converted into tax rates, using the Trend Growth Rate and holding all the other variables constant as in the base case fiscal analysis. The results showed that expenditures for an adequate level of transportation are higher than those contained in the base case; both for the County and the State. Nevertheless, the Board concluded that the alternative of not providing this level of service was fraught with danger to the future growth balance of the County, and therefore concluded with the recommendation that certain projects and policies be given high priority and either incorporated in the CIP and PSP or actively pursued at the State and Federal levels.

### The Bus System

As indicated above, the "base-case" utilized in the Fiscal Impact Analysis does not adequately state the real costs of a public transportation system for the county. The current CIP and PSP projections are based on existing current trends, but we know that existing conditions are not going to continue. The entire public transportation system must soon be completely overhauled due to the opening of the Metrorail system. To complement and supplement this metrorail system, the entire present bus system will have to be completely restructured.

A closer examination of the present proposed transit program reveals that it places its emphasis almost exclusively on Metrorail, assuming that almost all remaining bus services will "feed" the subway system, with the exception of a few remaining links of the present regional bus system which are proposed to be left in operation in the corridors not served by rail. The nature of this proposed future bus-transit system is not described very precisely in any existing policy documents. Therefore, it was necessary, in order to conduct any practical policy analysis of the fiscal impact of transit, to design a total county wide transit system, capable of providing a reasonable level of service to county residents. Only from such a total system design is it possible to measure reductions or additions to the system, both in terms of fiscal impact and in terms of quality of service. The system designed by our staff contains some similarities to existing bus routes, but it is predicated on an entirely different concept of bus service.

The bus network tested in this analysis is based on three distinct classes of service:

Class 1 Neighborhood Bus Service (featuring the use of mini-buses for both fixed route and demand responsive (eg: dial-a-ride) service. This service should be operated by the County to insure local responsiveness. It is not expected that it could operate

efficiently as a distributor service from or between major activity centers, due to limited vehicle capacity and the need for short routes circulating through neighborhoods. It could provide an important local feeder function for Metrorail. Such service will require a subsidy, and we assumed that the fare box would provide only one-third of its capital and operating cost - meaning a two-thirds county subsidy.

Class 2      Intermediate Bus Service, using intermediate sized buses to link 2 or more transit stations and county activity centers, and to collect or disburse riders for terminal points in the system. This class of service corresponds to WMATA's putative "Feeder" service, but is more oriented to county transit needs. To insure greater responsiveness to the county, it should be operated by WMATA under contract to the County. We assumed that it would operate at a 50 per cent subsidy.

Class 3      Regional Bus Service, utilizing standard sized buses, on major arterial highways, to provide regional service in areas not served by Metrorail. This service, operated by WMATA, should be expected to recover two-thirds of its costs from revenues, and the present WMATA deficit allocation formula should be applied to determine the county subsidy.

Figure 1 illustrates the analogy between these classes of transit service and highway classifications. Table 1 indicates the extent of the three classes of bus service that are contained in the staff's total County transit system design, and the associated costs used in the analysis.

In order to provide a comprehensive analysis of transit costs, it is necessary not only to know the classes and miles of service but also to be able to estimate the quality of the service. Unlike highway traffic analysis, there is no

Figure 1. Correspondence between Functional Classification for Highways and Transit

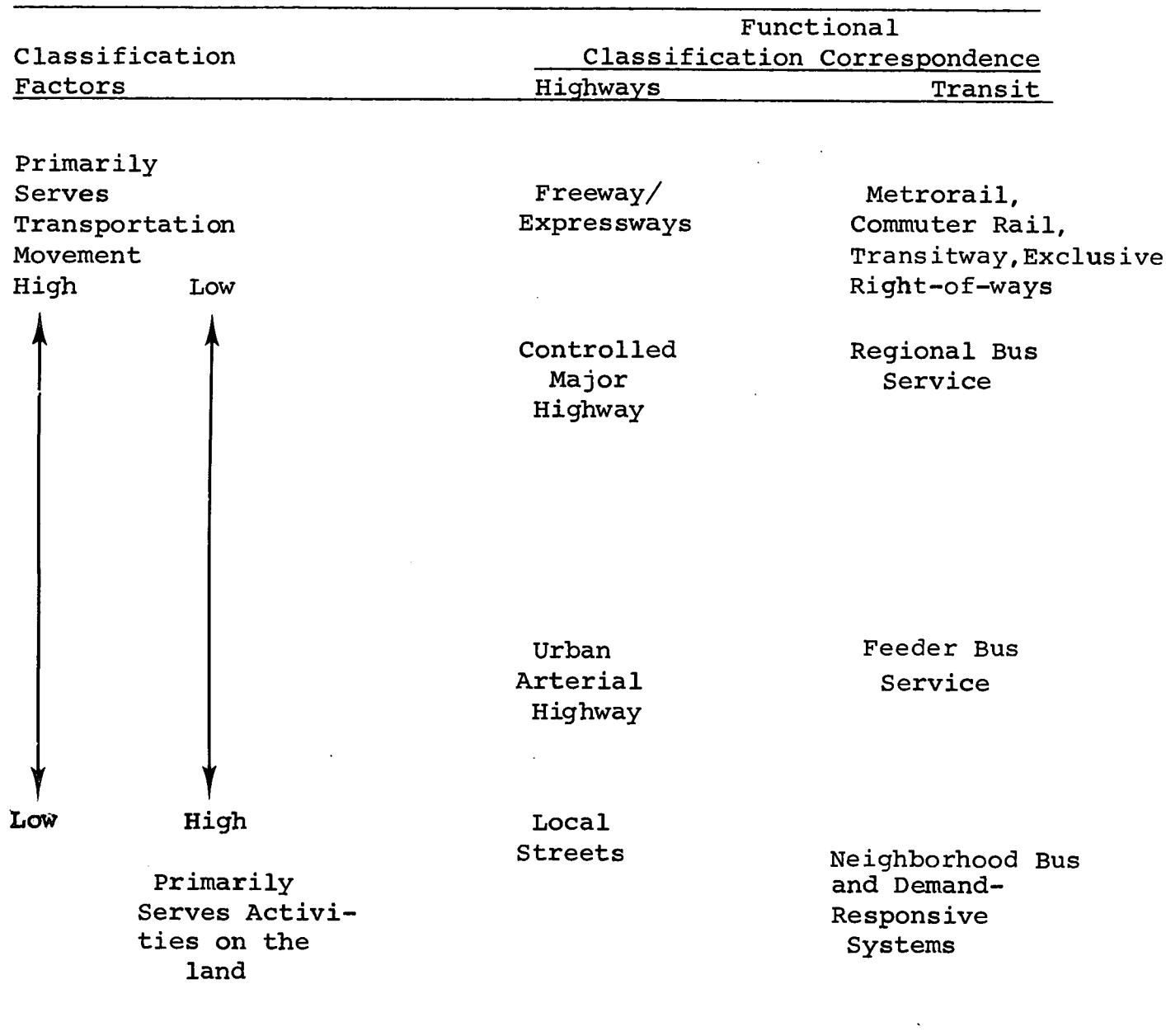


TABLE I  
BUS TRANSIT OPERATIONS

Class I	Neighborhood Service
	(a) Demand responsive (i.e. dial-a-bus) 6 zones requiring 66 buses
	(b) Fixed route services: 77 routes operating over 423 miles of routes, averaging 8.8 miles per route
Class II	Intermediate Feeder Service
	24 routes operating over 93 miles of routes, averaging 3.9 miles per route
Class III	Regional Bus Service
	24 routes operating over 206 miles of routes within Montgomery County, averaging 8.6 miles per route

TABLE II  
COST OF OPERATIONS

Class	Policy Subsidy Level	Annual Operating Cost	Annual Subsidy	Annual Capital Cost	Total Cost to County
I	66-2/3%	\$5,363,000	\$3,577,000	\$660,000 <sup>9/</sup>	\$4,200,000
II	50%	3,547,500	1,773,800	149,800 <sup>10/</sup>	1,900,000
III	33-1/3%	6,030,000	2,008,000	149,800 <sup>10/</sup>	2,200,000
		<hr/>	<hr/>	<hr/>	<hr/>
		\$14,940,000	\$7,359,000	\$960,000	\$8,300,000

9/ Assumes that County must pay 100% of all capital costs

10/ Assumes that the Federal government will pay 80% of the capital costs, and that Montgomery County will pay according to the deficit allocation formula: 11.52% of the non-Federal share. No State subsidy was calculated.

commonly accepted objective measurement of levels of service for public transit. It was necessary, therefore, to invent a system which could measure levels of service, so it would be possible to know what a certain level of expenditure would buy. The system developed by the staff is a grading system, similar to the "A" to "F" system used in grading levels of service for vehicular traffic.

The grades are based on the weighted measurement of a series of operating conditions: accessibility, travel time, reliability, directness of service, frequency of service, and passenger density.

Once the system was outlined and a standard established for level of service, it was then possible to determine the cost for such a system under different growth assumptions. As it turns out, the basic bus system is desirable for all of the growth alternatives. It is even highly desirable if no growth occurred at all. In public transportation, however, there is a certain elasticity of supply within the basic system. For instance, as population grows, the same buses run with more passengers, or with greater frequency, and with fewer passengers or less frequency if growth is slower. As labor costs account for the majority of operating expenses, these costs accrue even if the buses are idle. Therefore, although the cost of the service will vary under alternative growth rate conditions, it probably will not vary by more than 10 per cent from the estimated total cost.

What this means is that, first of all, once a basic bus system is established, no drastic changes in its size appear required as a result of different growth rates over the next decade. Secondly, while the total cost varies little, a low growth rate of ridership will produce lower revenues and, therefore, a larger operating deficit, while a higher rate of growth and riders will generate more revenues for a relatively constant system, and, accordingly, less of a deficit. However, because these differences in net deficit due to alternative growth rates are expected to be marginal, the same cost figure for the bus system is used in this analysis for all the growth

alternatives. Table II shows the estimated costs of the staff's total bus system design for the County. Under the financing assumptions shown on this table, the system described above will cost the County a total of \$8.3 million per year.

#### Fringe Parking

To improve transit utilization in certain low density, auto-congested corridors, a fringe parking facility is recommended as part of the total transportation design. These facilities should be located at:

Montgomery Mall (existing)  
White Oak  
Norbeck, just east of Georgia, or Aspen Hill  
River Road at I-495

The routes to serve these lots were included in the proposed Class I route structure. Over the ten year analysis period, the annual operating costs of the facilities (excluding bus operations) can be expected to be minimal. The total capital cost can be expected to be less than \$1.5 million, with the Federal and State Governments providing 100% of the capital cost under their respective fringe parking programs. Consequently, although they are conceived of as an integral part of the total system, no costs to the County were assumed for this purpose.

#### Commuter Rail

It is expected that current operations will be increased in the short-range future, with operations also inaugurated for reverse commute trips (from Washington and lower County areas to the I-270 corridor employment centers.) The system costs are borne primarily by the State, and therefore, County costs are expected to be less than \$50,000 per year. Consequently they are not included in this computation.

### Metrorail Capital Costs

The "base-case" included no capital costs for metrorail, as present official policies assume that the debt service on all capital costs will be covered by farebox revenue. Unfortunately, the evidence is rapidly accumulating to suggest that this no longer is a prudent assumption for fiscal planning. Moreover, it is evident that continuing and substantial financial participation by the Federal government is vital, if the Metrorail system, including the modification of the "A Route" to Shady Grove, is to be completed.

We examined three alternative financial scenarios for metrorail capital costs: "the Best Case" -- resulting in the lowest annual cost of the County; "the Worst Case" -- resulting in the highest potential cost; and another "Possible Case" -- resulting from an examination of the present financial situation. These are summarized in tables 6, 7, and 8. In each of these alternatives, the former "official" estimate of \$2.98 billion for Metro adopted regional system has been assumed to be fully funded within the base-case. In other words the costs included in tables 6, 7, and 8 are only those over and above the base-case.

This analysis, especially the "worst case," reveals how crucial federal and state assistance is to meeting Metro Capital Costs, even without further cost escalation. It also suggests that, from the point of view of Metro financing, there does not seem to be much difference in the "Up-County," "Down-County" or "Trend" distributions insofar as the transportation tax rate is concerned; but that there is some difference between the High and Low alternatives. This is particularly true if the "worst case" should occur and the County would have to meet the full local share of capital costs. For the purposes of this analysis, we assumed a total Metrorail capital cost of \$6.0 billion, and the "Possible Case" distribution alternative, as the basis for assessing fiscal impact. These assumptions result in a total cost to the County that increases with the construction of the system to an amount of \$2,700,000 per year in 1985.

TABLE #6  
METRORAIL CAPITAL COSTS  
"BEST CASE"

Assumptions:

The system costs will continue to escalate to one of the three final estimates below. The state will pay 75% of the local share due from Montgomery and Prince George's Counties; and the Federal government will pay 80% of the total cost.

(Note that this analysis assumes that the "official" estimated cost of \$3.0 billion has already been funded elsewhere, and therefore, it only includes estimates of the net additional funds required to meet the escalating cost situation.)

	Cost Estimate 1	Estimate 2	Estimate 3
TOTAL COST	\$5.0 Billion	\$5.5 Billion	\$6.0 Billion
Net Additional Cost	2.0 Billion	2.5 Billion	3.0 Billion
Federal Share	1.6 Billion	2.0 Billion	2.4 Billion
Local Share (Md., Va., DC)	.4 Billion	.5 Billion	.6 Billion
Md. DOT Share (75% of "Local")	57,200,000	71,500,000	85,800,000
Montgomery County Share	19,000,000	23,800,000	28,600,000
Annual County Cost*	\$1,200,000	\$1,500,000	\$1,860,000

\* Assuming general obligation bonds amortized over 30 years at 5.0% interest.

IMPACT ON 1985 PROPERTY TAX RATE  
(in terms of the assumptions of the base case)

Growth Policy Alternatives	Estimate 1	Estimate 2	Estimate 3
Alt. #1 <u>Trend</u>	1.7¢	2.1¢	2.5¢
Alt. #2 <u>Down-County</u>	1.7¢	2.1¢	2.5¢
Alt. #3 <u>Up-County</u>	1.7¢	2.1¢	2.5¢
Alt. #4 <u>Low Growth</u>	1.9¢	2.4¢	2.9¢
Alt. #5 <u>High Growth</u>	1.6¢	2.0¢	2.4¢

TABLE #7  
METRORAIL CAPITAL COSTS  
"WORST CASE"

Assumptions:

The System costs will continue to escalate to one of the three final estimates below. There will be no available increase in funds from either the State or Federal governments; and Montgomery County's share of the capital cost will remain at 19.06%.

(Note that this analysis assumes that the "official" estimated cost of \$3.0 billion has already been funded elsewhere, and therefore, it includes only estimates of the net additional funds required to meet the escalating cost situation.)

	Cost Estimated	Estimate 2	Estimate 3
TOTAL COST	\$5.0 Billion	\$5.5 Billion	\$6.0 Billion
Net Additional Cost	2.0 Billion	2.5 Billion	3.0 Billion
Montgomery County Share	381.2 Million	476.5 Million	571.8 Million
Annual County Cost*	29,200,000	36,500,000	43,800,000

\*Assuming general obligation bonds amortized over 30 years at 6.5%.

IMPACT ON 1985 PROPERTY TAX RATE  
(in terms of the assumptions of the base case)

Growth Policy Alternatives	Estimate 1	Estimate 2	Estimate 3
Alt. #1 <u>Trend</u>	40.0¢	50.0¢	60.0¢
Alt. #2 <u>Down-County</u>	39.5¢	49.4¢	59.3¢
Alt. #3 <u>Up-County</u>	39.4¢	49.3¢	59.2¢
Alt. #4 <u>Low Growth</u>	45.4¢	56.8¢	68.1¢
Alt. #5 <u>High Growth</u>	37.4¢	46.8¢	56.1¢

TABLE #8  
METRORAIL CAPITAL COSTS  
"A POSSIBLE CASE"

Assumptions:

The system costs will continue to escalate to one of the three final estimates below. The Federal government will continue to participate, so long as the District of Columbia uses \$500 million of money allocated for Interstate Highways for Metrorail, and Maryland allocates \$70 million. The Federal share will be 2/3 of the remaining cost. (Rationale: Metro receives direct funding under unique legislation. New legislation is not possible to increase that Federal share; however, an extension of the total amount is possible.) The State government is able to provide 75% of the local share of the two counties.

(Note that this analysis assumes that the "official" estimated cost of \$3.0 billion has already been funded elsewhere, and therefore, it only includes estimates of the net additional funds required to meet the escalating cost situation.)

	Cost Estimate 1	Estimate 2	Estimate 3
TOTAL COST	\$5.0 Billion	\$5.5 Billion	\$6.0 Billion
Net Additional Cost	2.0 Billion	2.5 Billion	3.0 Billion
Interstate Transfers	<u>-570 Million</u>	<u>-570 Million</u>	<u>-570 Million</u>
	\$1.430 Billion	1.930 Billion	2.430 Billion
Federal Share (2/3)	953,800,000	1.287 Billion	1.621 Billion
Md. DOT Share (75% of Local)	68,100,000	91,900,000	115,700,000
Montgomery County Share	22,700,000	30,600,000	38,500,000
Annual County Cost*	1,600,000	2,100,000	2,700,000

\* Assuming general obligation bonds amortized over 30 years at 5.5% interest

IMPACT ON 1985 PROPERTY TAX RATE  
(in terms of the assumptions of the base case)

Growth Policy Alternatives	Estimate 1	Estimate 2	Estimate 3
Alt. #1 <u>Trend</u>	2.1¢	2.9¢	3.6¢
Alt. #2 <u>Down-County</u>	2.1¢	2.8¢	3.6¢
Alt. #3 <u>Up-County</u>	2.1¢	2.8¢	3.6¢
Alt. #4 <u>Low Growth</u>	2.4¢	3.3¢	4.1¢
Alt. #5 <u>High Growth</u>	2.0¢	2.7¢	3.4¢

### Metrorail Operating Costs

The "Base-Case" did not contain operating costs for Metrorail, again, because prior policy had not acknowledged their probability. Evidence is mounting to suggest that this also is no longer a prudent assumption to make. We suggest that metrorail operating costs is an area where careful monitoring will be necessary after operations begin, because, at present, there is no data which can be utilized to estimate the deficit, in as much as the 1974 Net Income Analysis remains unavailable and the fare structure has yet to be established. In order to provide a rough estimate, to allow some "Kentucky Windage" in our fiscal aim, we have suggested a minimum cost to the County of \$2,500,000 per year.. This assumes a \$30,000,000 annual system deficit, of which 50 per cent of our "share" (approximately 16 per cent) is paid by the Federal or State government. We fear that this is an underestimation of what may actually occur.

### Cross-County Transit Ways

Pending results from studies now underway, it would appear that there is a need for a high quality transitway to operate in the right-of-way of the Georgetown Branch of the B&O Railroad, providing service from the Defense Mapping Agency (in the Brookmont area) to Silver Spring. Also, to be able to meet the transit travel needs between the Georgia Avenue corridor and the Twinbrook/Nicholson major employment area of the Rockville corridor, existing information suggests that some of the capacity of the "Rockville Facility" should be reserved for transit facilities. Whether reserved lanes for transit will be required cannot be determined until completion of the current Rockville Facility Study by the State Department of Transportation. Such a transit facility would be calculated as a road cost, and does not need to be accounted for here.

Summary

In summary, the transit system outlined above will cost the County about \$13.4 million annually by 1985, as follows:

Bus Service (Capital and Operating)	\$8.3 million
Metrorail Capital Cost	\$2.7 million
Metrorail Operating Cost	\$2.5 million
Fringe lots, commuter rail	(less than \$50,000)
	<hr/>
	\$13.5 million

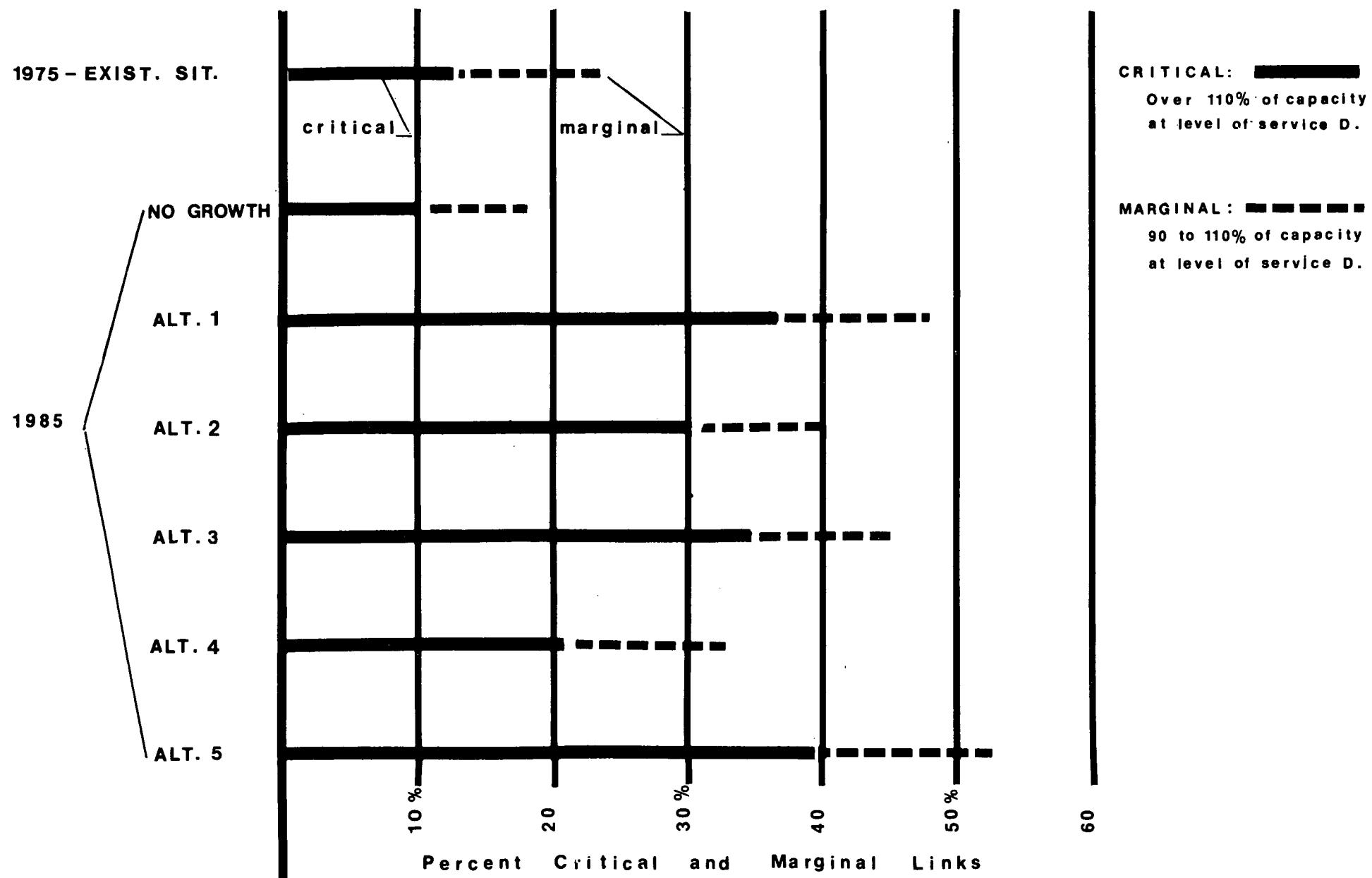
## HIGHWAYS ANALYSIS

The base-case fiscal report assumed the continuation throughout the decade of the levels of capital and operating expenditures shown in the CIP/PSP. These documents project a future in which annual expenditures level off after a few years to an average of approximately \$10 million in the CIP and \$12 million in the PSP for County roads, bikeways, and sidewalks. It is not clear how this leveling off would correlate with the growth rate during the six year period, this uncertainty is further clouded by the fact that, historically, highway expenditures generally have not kept up with the schedules shown in the adopted programs. Furthermore, state estimates for capital costs of approximately \$10 million per year represent a continuing reduction in the level of programmed expenditures for State highways in the County. The combination of these factors, when compared to the Trend Growth rate, suggest that there will be a decline in highway level of service under the expenditure assumptions of the CIP and PSP.

Within this context, the staff's analysis of the existing road conditions in the County, and their projection of these conditions into the future, (as outlined in the above methodology section), did indeed produce the conclusion that the CIP/PSP projected level of service for roadway travel in 1985 will be greatly below present levels, under any of the alternative growth assumptions of the base-case report.

Figure #3 is a highly simplified graphic representation of a complex staff analysis that examined the major roadways of the County from the perspective of their traffic capacity, and made a judgment about how much of the roadway system would become critically congested by 1985 under the different growth assumptions. In making this base-case analysis, the roads that are in the County CIP and the State Five-Year Program were assumed to be built on schedule, and the adopted regional transit system reflected in the CIP was also assumed to be built on schedule and operating as planned, producing a significant diversion of trips from auto to transit. It should be noted in this regard, that a very large proportion of the total

LEVEL OF SERVICE OF THE HIGHWAY SYSTEM IN THE COUNTY  
 -- BASE CASE ANALYSIS --



trips on the transit system must be carried by bus, either regional or feeder to the rail stations, and such buses must travel on roadways. Thus, conversion of auto trips to bus travel reduces the need for highway capacity by some degree, but does not eliminate it.

Figure #3 portrays the percentage of the major roadways in the County, called "Links" in the road network, which by 1985, would become loaded with traffic to a level that approaches or exceeds level of service D, under each of the alternative growth assumptions. Those links that are expected to reach 90-110% of capacity were labelled marginal; those that exceeded 110% of capacity were labelled critical.

Also shown is the existing level of service in 1975, and the level of service in 1985, under current funding policies, if absolutely no growth at all took place within the County. In the latter case, although the volume of through traffic on our roads, due to growth in neighbouring jurisdictions, would rise, it would be offset by 1985, by the additional capacity of the new roads now in the County CIP and State Five-Year Program pipeline; so that the net result would be a slight improvement over the existing situation. The interesting thing about this, however, is that even the present situation is deficient by the standards we have accepted as policy.

The results of the growth rate assumptions show that the Low Growth Rate (#4) produces the least increase in traffic congestion, but even that increase is significant. If the expected Trend Growth Rate comes to pass, by 1985 almost 50% of the major road links of the County's transportation system will be either marginally or critically overloaded, (a 100% increase in the present percentage of overloaded links); and therefore will generate significant time delays, safety problems, and additional auto exhausts, produced by stop-start driving through intersections. Secondary effects of these conditions would therefore include increased air and noise pollution, spill-over traffic effects adjacent to major bottlenecks, and possible reduced property values. Since poor levels of

of highway service create a chain-reaction of such undesirable effects, policies to lessen these effects as much as possible would be desirable.

#### Policies Options

If level of service conditions are to improve, a combination of area-wide policies will be required, including: acceleration of major road projects, initiation of intensive programs for increasing transit ridership and carpooling, and careful staging of land development and transportation facilities.

Densely-developed portions of the County, will require the kind of detailed and special attention which is being given to them in sector plans. Since extensive new road building is often not feasible in these areas, it has been necessary to reduce the total amount of additional land development that can be permitted, in order to prevent intolerable levels of congestion, and to promote a strategy for dealing with air quality problems. Even with much more strict controls on development, the sector plan areas must be carefully monitored.

A passive approach to the problem would be to allow congestion to occur and hope that auto drivers will voluntarily shift in sufficient numbers to mass transit or carpools. The danger of this approach is that auto drivers may very well become resigned to congestion, stay in their cars, become accustomed to longer travel times, and in the process perpetuate a worsening congestion and air quality situation. Such an attitude could also preclude or void positive action designed to encourage growth in areas where people have the option to use public transportation instead of automobiles thereby helping to reduce overall levels of congestion and air quality problems.

An active approach, on the other hand, would recognize that new bus and rail transit service will help the situation, particularly if an intensive program for encouraging transit travel is initiated, but that the existence of transit alone cannot hope to absorb enough new travel demand to prevent

serious congestion and air quality problems. Additional active measures will be needed, such as incentive programs for increasing car occupancy, preferential lanes for buses and carpools, flexible or staggered work hours, and land development staging plans that are monitored for consistency with transportation and environmental standards. Rather than resorting to congestion to change ingrained driving habits, the active approach would take initiatives to promote alternatives to the single-occupant automobile, through a carefully-designed set of incentives and disincentives to prevent further aggravation of congestion and air quality problems.

#### Program Emphasis

The Subsystem Analysis shows that while the base-case CIP capital expenditures for County roads are set at an adequate funding level, (because County roads are rarely major traffic arteries and, therefore, have little leverage on overall congestion levels,) the PSP by contrast, appears to underestimate operating expenditures. Emphasis should be placed on bolstering County operating expenditures in order to meet the increasing service demands of a growing population. Additional travel demands will require increased road maintenance and traffic operation expenditures. Moreover, as management techniques such as transit and carpool incentive programs increase in importance, added costs would have to be reflected in the PSP.

Since the bulk of the County's travel occurs on State-controlled routes, and no County capital funds are normally expended for such routes, it makes sense from a traffic service as well as financial standpoint to support whenever possible reasonable highway improvement proposals by the State. County CIP projects in most cases are too minor to have a major impact on overall levels of congestion in the system, particularly in the down-County area; and therefore are not substitutes for more effective State projects. There also is a greater financial burden on the County when piece-meal County projects are built in lieu of larger State projects. For example, while

needed to ease local traffic, improvements to Randolph Road, Bonifant Road, or to Bel Pre Road will cost the County millions of dollars, and still will not carry the traffic volumes needed in the Rockville Facility corridor.

In examining the "critical" and "marginal" traffic problems of the next 10 years and matching needs against existing State programs and levels of expenditure, we estimate that the County will require much higher State highway capital expenditures (\$33 - \$47 million more than the \$10 million per year currently being spent) if extremely serious levels of congestion are to be avoided.

Nearly 80% of this amount should be allocated to the primary highway program, while 20% should be allocated to secondary highway program. Such expenditures represent a quantum jump in State highway expenditures for the County; increasing by about 100% the amount of secondary highway funds currently distributed to the County, and capturing an amount equal to 60% of all current State-wide primary highway funds. Such large-scale expenditures are needed not only to accommodate new growth but to meet current deficiencies. Nearly half of these expenditures would be required to meet existing needs--regardless of whether or not there is any new growth in the County. The lack of significant primary highway construction in the County during the past several years has contributed to the accumulation of much of this unmet need.

#### Project Recommendations - Capital Expenditures

The Subsystem Analysis identified approximately 50 major State and County highway projects, not included in the base case analysis, that are reasonable candidates for construction during 1975-1985 if adequate service levels are to be met in the future. This total varies slightly depending on the growth alternative analyzed, but, in general, most projects are needed for all alternatives. Practically all of these projects are under State jurisdiction, the majority of expenditures being for primary highway projects. The following listing contains the most important projects.

- (1) Priority number one in our estimation is the Rockville Freeway in conjunction with the eastern segment of the Outer Beltway. These two East-West Highway projects offer the most to the County in terms of relieving a very serious cross-County travel situation. Montrose Road and Randolph Road, even if improved to the highest degree feasible, cannot come close to providing the cross-county capacity needed by 1985. In all growth alternatives, including no growth, the Rockville Pike area is persistently congested, and can be best relieved only with more capacity for cross-county traffic south of Rockville. Moreover, this second cross-county freeway is urgently needed to relieve the rapid growth of traffic on the Capital Beltway. Since much of the planning has already been completed, right-of-way has been protected, and no local funds are involved, the Rockville Freeway/eastern end of Outer Beltway project deserves support and an accelerated schedule.
- (2) Assuming that the Metrorail system will be completed to Rockville and extended to Shady Grove, a high priority project will be the I-270 Highway Connector to the Shady Grove Terminal Station. This project lies within the right-of-way of the western end of the Outer Beltway. Since the western segment of the Outer Beltway, from the Rockville Freeway to the Western Arterial, is not as critical a need as the eastern segment prior to the later stages of development in Germantown (but is essential to those later stages) a short 4-lane freeway connector to the Shady Grove station could be built initially, and the western portion of the Outer Beltway could be constructed to its full 6-lane cross-section within the subsequent 10-year period.
- (3) The Capital Beltway (I-495) is destined to be a highly congested freeway during 1975-1985. Most of the freeway is already at its ultimate capacity with only

a few feasible widening projects in sight. One such project is the realignment and widening of I-495 between Rockville Pike and Georgia Avenue. This project would not only increase capacity, but would help alleviate a very serious safety problem on this section of the freeway.

- (4) Another critically-needed Capital Beltway project is the widening of I-495 between the Potomac River crossing and the River Road interchange. This segment is already experiencing capacity problems that will certainly get much worse as land development increases in the region. Widening the Beltway on both sides of the river to 8 lanes will be only a short-term solution to western crossings of the Potomac River. For the longer term, the only foreseen recourse to this situation is another crossing farther upstream as part of the western extension of the Outer Beltway. This extension can be built only when agreement on a crossing can be reached with Virginia.
- (5) The I-270 Corridor will bear the brunt of up-County growth during 1975-1985. The Western and Eastern Arterials would provide considerable relief for I-270, but additional widening of I-270 will still be needed from Montgomery Village Avenue southward to I-495, plus improvements at most of the interchanges along this stretch would be required. Additional interchanges are also needed to serve the corridor cities.
- (6) Due to the continued growth of Columbia, Northern Prince George's County, and the northeast portion of Montgomery County, the U.S. 29 Corridor will require additional capacity. Greatly increasing transit service and carpooling would be the only alternatives to upgrading U.S. 29 to freeway status. An intermediate solution is to widen U.S. 29 from New Hampshire Avenue to the Howard County Line to 6 lanes. A new U.S. 29 spur to University Boulevard plus wider

approaches at Four Corners would relieve a highly congested situation there. Recent experience shows need for alternate route.

- (7) Since the transit access road projects in the FY 76-81 CIP plus those suggested for the FY 82-86 period will be so vital to the success of Metrorail, they deserve priority status. Cost estimates for additional access projects at Forest Glen, Wheaton, Glenmont, Twinbrook, and Shady Grove stations were included in the Base-Case analysis.

These seven projects represent only the highest priority links in the system, for which there appears to be few reasonable alternatives, if even the existing levels of service are to be maintained. Other projects are not "minor", but none have the leverage for improving service that these have.

#### Project Recommendations - Operating Expenditures

If the street and highway system and tripmaking in the County increase due to new growth, then the road maintenance, administration, traffic operations, traffic management and minor safety and capacity projects will require greater operating expenditures. Some of the more notable directions for increasing operating expenditures follow.

- (1) One of the highest priorities as far as new operating expenditures are concerned is development of a carpool matching program in the County. Carpooling has been shown to be an extremely cost-effective means of commuting during peak periods. It is also one of the best ways to get more efficient use of the existing highway system. Carpooling programs are particularly needed in densely developed parts of the County, such as areas where Sector Plans are being developed. Transit will certainly be helpful, but additional measures to reduce one-occupant vehicles will also be needed to reduce traffic congestion and air pollution

in these areas. Incentives for carpooling, such as preferential parking spaces, will need to be reinforced by disincentives for one-occupant vehicles, such as parking limitations. A "Personalized Carpool Matching Project" should be undertaken as a prototype County carpooling project. Such a project has been proposed by the M-NCPPC transportation planning staff.

- (2) In conjunction with a carpooling program the County should initiate a transit ridership program. This program would emphasize the benefits of commuting by transit through an intensive marketing approach. The goal would be to increase the shift to transit to a much higher degree than is currently envisioned. The program should concentrate primarily on areas where Sector Plans are being developed. This means that funding is needed for an effective transit marketing program in County DOT. A well-conceived program will generate enough transit revenue from new riders to more than justify its cost.
- (3) A flexible or staggered work hours program could also be developed for Sector Plan areas to reduce peak period tripmaking. Promotion and coordination of this program by the County is highly desirable. The County should encourage a regional/federal program of staggered work hours to obtain better use of its road capacity.
- (4) Over two years ago, a Planning Board consultant recommended, and the Board endorsed, a prototype traffic management plan for Connecticut Avenue, designed to "manage congestion" to make that artery flow more freely and to give preference to buses, as well as other bus lane improvement ideas contained in the Peat, Marwick, Mitchell report on Short-Term Bus Improvements. Widespread use of such management approaches to road capacity is vital, especially in the down-County area.

(5) The present PSP shows a significant increase in expenditures for maintenance and minor road projects, for the first two years, and then a leveling off for the last four years. Without having examined this in depth, we question whether the increase should not have been continued beyond the first two years. A proper study of this by County DOT could develop some quantitative relationships between the size and condition of the road network and past and projected levels of maintenance expenditure. In the meantime, we have assumed that some increase should be shown for maintenance costs, and are suggesting at least \$3,000,000 for fiscal estimating purposes.

The combination of the above programs would add about \$4,000,000 to the annual highway operating costs, above the amount contained in the base-case (i.e., \$1,000,000 for carpooling and transit inducement programs, etc., and \$3,000,000 for added highway operating expenses).

### Summary

The highway program outlined in concept form above would not require any higher county expenditure level for capital costs than the amount already budgeted in the CIP and the base-case; but it would require about \$4,000,000 more than the amount budgeted in the PSP and the base-case. In terms of state highway capital expenditures, the system would require a fourfold increase in the present level of state funding allocated to the county.

When you add county highway costs to total county transit costs, and compare them to the expenditure level derived from the CIP and PSP for the base-case, you end up with the need for an additional \$4,500,000 per year, above the base-case, to finance this total system.

<u>Annual County Costs</u>	<u>Base-Case<sup>11</sup></u>	<u>New Design Concept</u>	<u>Net Difference</u>
Transit Capital Costs	\$ 300,000	\$ 3,700,000	\$ (+) 3,400,000
Transit Operating Costs	12,800,000	9,900,000	(-) 2,900,000
Highway Capital Costs	11,000,000	11,000,000	-
Highway Operating Costs	11,700,000	15,700,000	(+) 4,000,000
<b>TOTAL</b>	<b>\$35,800,000</b>	<b>\$40,300,000</b>	<b>\$ (+) 4,500,000</b>

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11/ Derived from more detailed versions of Tables No. 3 and 4 on pages 24 and 25.

## OVERVIEW AND CONCLUSIONS

### Fiscal Conclusions

The foregoing analysis has examined the environmental sub-system components of sewage treatment, water supply capacity, and air quality; and the transportation sub-system components of transit, highways, and other modes. It has focused on techniques for measuring levels of service, or quality of life, especially in the transportation sub-system. It has proposed a particular level of service to fit the needs of the Trend Growth Rate; and it has made an estimate of the cost to the public of providing the support facilities and operations necessary to maintain that level of service.

The conclusions of this analysis are that public money can be saved by postponing, to 1990 or later, about half of the presently programmed capacity of the new sewage AWT plant and Potomac Water Supply Filtration Plant; but that extra revenue will be needed to support the transit and highway system necessary to produce the desired level of service outlined in this report in transportation. Savings from the first action would amount to about \$2,300,000 per year, for a 10-20 year period (depending on when the second phase of these plants was added). Extra costs from the second action would amount to roughly \$4.5 million per year for an indefinite period of time. Without stopping to measure precisely how these debt service payments and operating costs might be spread out over time, we may say that the net extra cost generated by the two actions combined would add about \$2,200,000 per year by 1985, and would therefore increase the 1985 tax rate shown in the base-case fiscal analysis by about 3.0 cents, a relatively small additional increase compared to the total shown in the base-case for the Trend Growth Rate. 12/

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12/ See "Fiscal Impact Analysis," Second Annual Growth Policy Report, September 1975 (p.29).

In developing the foregoing fiscal conclusions, the Planning Board found itself constantly coming back to a simple idea that seemed to deserve emphasis. Although it is certainly not a new revelation, it does seem to merit prominent attention. We call it the concept of "FISCAL INCREMENTALISM;" and think of it as the idea of favoring public facility packages that are each as small as possible, so that the growth curve of public service costs may be tailored in as close a fit as possible to the most likely growth curve for private development.

#### Interpretive Conclusions

The concept of Fiscal Incrementalism when applied to water and sewage capacity resulted in proposals for some savings. In these cases, the "level of service" or "quality of life" criterion is rather simple. You either have service or you do not. Since both water and sewage treatment are virtually absolute necessities for urban growth, the analysis basically becomes one of calculating relative magnitudes over time.

In the case of transportation, however, the level of service criterion becomes much more complex, and the application of the concept of Fiscal Incrementalism to this criterion also becomes more complex. Transportation service is not an absolute that you either have or do not have; it has many intermediate shades and alternatives in its spectrum of possibilities. In spite of this difficulty, we can attempt to portray a few simple policy conclusions from this transportation analysis.

One is that the amount of money currently programmed for County transportation expenditures in the CIP and PSP is sufficient, with a little extra for maintenance and operating expenditures, to construct a total balanced transportation system capable of serving the needs of the County in a relatively adequate manner.

However, this is a conclusion derived from the County fiscal perspective alone. From the institutional perspective, greater effort will be required than is implied by either the present CIP or PSP.

To achieve the needed highway system, the County will have to convince the State Department of Transportation to accelerate its funding and construction program as outlined above. To achieve the necessary bus system, the County will have to convince the Washington Metropolitan Area Transit Authority to redesign its bus system to fit the design concept outlined. The County also will have to set up its own bus operation for neighborhood service, plus institute an active transit incentive program within the County Department of Transportation. And finally, the County will have to convince the Federal and State governments to fund the extra Metrorail capital and operating costs in the proportions outlined above or better. The successful achievement of all these objectives will require considerable effort on the part of elected and appointed officials and key staff participants. Unless this degree of effort is exerted, the prospects appear very good that, at least for transit, costs will be much higher, and efficiency of service much lower, than we have projected.

Another conclusion may be developed with respect to air quality. It derives from the relationship between transportation and land use. Our transportation analysis reveals that much effort will be required to achieve a balanced transportation system; and that the success of this system will depend on: (a) providing an adequate level of fine-grain bus service; (b) providing enough new major road links to allow auto traffic to flow decently and to thereby avoid having the bus system become entrapped by excessive auto congestion; and (c) developing an active transit incentive program (including auto disincentives as well as preferential bus lanes and signaling) to stimulate a greater shift in behavior patterns than might otherwise occur. In

short, excessive traffic congestion can only be prevented by a major effort: (1) to provide enough roadway capacity to carry auto traffic; (2) to build an ubiquitous surface and subway transit system; and (3) to induce people to ride it.

This relates to air quality through the linkage of automobile emissions. We are told that these emissions constitute the bulk of the pollutants that create the air quality problem of the Washington Metropolitan Area. Reducing air pollution, therefore, depends on reducing the amount of automobile exhaust pollutants. Obviously one way to do this is by reducing the total number of vehicle miles travelled, which is to say; by reducing the number of auto trips that people take in the region, or by reducing the average length of these trips, or by increasing the average ratio of persons to vehicles for each trip, or by all three at the same time.

The first two are very difficult to achieve, except over a very long time span, because they involve major changes in existing land use and human behavior patterns, not to mention a lessening of the quality of life in terms of the number of choices and opportunities available to people. The third one is achievable by shifting travel behavior towards the major use of carpooling and transit. This one clearly relates to the general strategy outlined previously for achieving a balanced transportation system. Thus, air quality strategy links to transportation strategy in terms of the common need to shift travel patterns to carpooling and transit.

At this point a complication arises, as a consequence of the fact that we are unlikely, under anything short of a total rationing of gasoline, to be able to shift the vast majority of people from auto to transit travel. Even under the best of foreseeable conditions, transit ridership is still likely to capture less than a third of the total travel needs in the region. This means that all land use trip destinations must assume that, while some of their

users will arrive by transit, even more will come by car. New growth, therefore, especially employment, commercial and service concentrations, must be assumed to generate new auto traffic demand as well as new transit service demand.

This fact, when combined with the fiscal realities of transit, creates a dilemma for local governmental growth management efforts. The general strategy to overcome traffic congestion is to fund and build a transit system. It is inherent in the nature of a transit system that it must be built with large enough vehicles and sufficiently frequent service to attract a minimum number of patrons away from the automobile; and it is also in the nature of the present development patterns of the Metro area that the introduction of this level of transit service into our area will provide more capacity than is likely to be used by the number of riders who can be diverted to it. Hence, there will be unused capacity in the transit system.

This would be tolerable, except for the fact that it is also in the nature of the investment needed for transit that it cannot operate at a profit unless it achieves a very high volume of ridership at a low fare price, or a small volume of ridership at a very high fare price. Because of the existence of the automobile option, it is impossible to achieve a sufficiently high volume of ridership to break even, even under a low fare structure; and consequently it becomes a truism that transit systems in an automobile world must operate at a deficit, that must be funded from a general tax levy.

The combination of these factors results in a situation in which it becomes fiscally desirable for new growth to be located so that the trips generated by it can be served by transit to the maximum extent possible. But wherever new growth is located it will also generate auto traffic. And auto traffic relates to air pollution through automobile exhausts.

It should be clear that the strongest strategy, from the perspective of air quality alone, would be to focus as much new growth as possible at transit stations and bus stop locations, so that the maximum reduction in auto travel from this new growth could be accomplished. This would also be a desirable fiscal policy with respect to transit operations. However, to do this in large amounts not only would not be acceptable from the community impact perspective, it also would generate local "hot spots" of air pollution created by the additional auto traffic induced by the new growth (which, we have said above, can never be totally converted to transit). This is the air quality dilemma referred to previously. The macro-scale solution to the general air quality problem tends to generate additional micro-scale air quality problems.

Because of this dilemma of forces and tendencies that work counter to each other, growth management efforts are forced to move towards an even finer grain examination to find just where the proper balance point among them is located. We have mentioned our future work program of probing the carbon monoxide "hot spots" probabilities in our current sector planning efforts. In the meantime, however, we think the Council should give serious attention to an entirely different dimension of this air quality problem, one we have only briefly mentioned above--the option of a cleaner automobile engine.

We think that there is greater promise of achieving air quality improvement faster by concentrating on the automobile engine than by concentrating on land use controls. The automobile engine is a specific technical problem that lends itself perfectly to a research effort in which the vast resources of the greatest technical society in the history of the world can be focused. It has relatively little of the confusing cross-currents of socio-political research, and has a large body of physics and chemistry and engineering on which to draw. By contrast, the effort to control the daily movement patterns of vast metropolitan areas through land use controls is hampered by the complications

of unknown socio-political dimensions, less historical experience, amorphous and diffuse institutional structures, and a general lack of firm theory and data. In short, the engine problem can be captured and defined within the microscope lens of technology; but the travel problem is like flinging a net around the universe through telescope scanning.

For these reasons we recommend that the Council initiate actions to explore this matter with other local jurisdictions and with our own representatives in Congress to press for the maximum effort within the automobile industry to speed up the timetable for the development of a cleaner engine and a less polluting net of automobiles on the streets. Unless action is taken on this front, it seems likely that local governments across the nation will be left alone to bear most of the burden of resolving an extremely difficult problem through control that will impact the lives of millions in ways that they are unlikely to find enjoyable. Some possibilities that may have to be examined eventually, if local land use and transportation controls are primarily depended upon to improve air quality, would include: enforced parking restrictions, gas rationing, prohibition of new employment centers, etc. All of them obviously have significant implications on such other areas of governmental concern as revenue bases, taxation policies, and quality of life.

However, as important as is this matter of emission standards, local growth management must by no means be given less attention. Air pollution is not the only environmental problem that impinges on transportation policy. There is the vital matter of energy supply.

In last year's "Framework for Action" report, we suggested that the relaxation in gasoline rationing after the 1974 crisis resulted in a general reduction in concern by the average person, for the long term implications of an increasing scarcity of motor fuel. We suggested further, that in an affluent jurisdiction such as Montgomery County, even a very large increase in the per gallon price of gasoline would be unlikely to bring about major changes in behavior, unless it were accompanied

by a perception that the change was permanent and part of a long term trend. We suggested there was a probability that such a change in perception could come about in the future, but that it had not happened yet.

In the meantime, there are others who have argued that fuel shortages are not necessarily the only option for the future, and that alternative sources and kinds of fuel will be brought into production, so that current habits of automobile usage, which are obviously desired by a very large segment of the population, should continue to be used as the basis for future land use planning. We do not support this view, since we cannot find sufficient evidence to justify such optimism. However soon or late it develops, every indication points to a long term trend towards increased fuel prices as a consequence of an increasing scarcity of limited natural resources.

Accordingly, we feel that the forthcoming investment in a practical transit system may be seen by succeeding generations as a literal life-saver, and as necessary to the continuous daily functioning of this metropolitan area as were the transit systems of the besieged cities of Europe during the bombings of World War II. Unfortunately, the public costs will be perceived as being relatively high, because not only must they include the high cost of constructing the system, they must also include the shift of some costs to the public sector that are now being borne by the private sector. Because the auto is an all-purpose vehicle (work-school-shopping-recreation-leisure), its relatively heavy costs are absorbed without much overt recognition by the average private family. When some of this cost gets transferred to transit, it receives a spotlight of attention that it heretofore escaped. This perception problem, together with a general human reluctance to "let go" of the luxury of the private auto, makes the decision-making with respect to transit more difficult when its fiscal impact is brought into the picture.

In spite of the difficult choices that are forced on us by a detailed examination of all conceivable future transportation

costs, we believe that the public is better served by such analysis, and by constructive criticism of it, than by overly simplistic generalizations about efficiency. To the best of our ability, we are trying to probe the uncertainties of the future to determine what is really best for the citizens of Montgomery County in the long run. At present we think the present overall growth management strategy now in motion is the most prudent course to take, both in its community and sector planning phases and in its regulatory and general planning phases, of which this report is one of a continuing series.

### Next Steps

This analysis has been intended to show how the Planning Board's "base-case" Fiscal Impact Analysis, as described in the September Second Annual Growth Policy Report, can be coupled up with additional studies, to examine various components of the growth management problem, and to relate fiscal impact to level of service within these components. With the technical report that will be forwarded in several months, the Council should have a better basis for making value judgments about the most appropriate levels of service for the transportation sub-system. With this tool, adjustments to transportation expenditure levels can be translated into their effect on levels of service, and, through discussion and evaluation, Council can begin to reach a judgment about the relative value of these expenditures to the "quality of life" goals of the County.

Further such analyses that probe into the "level of service" and "quality of life" aspects of the other sub-systems of public costs can be undertaken. As more analyses and evaluations build up in each of the five "quality of life" compartments of the growth policy model,\* the Council should be increasingly able to convey to the public a better understanding of the practical trade-offs that are required by a responsible and comprehensive approach to the growth management problem.

We are looking forward to discussing these findings with you on October 17, and to proceeding further into detailed staging alternatives for the sub-systems mentioned above, in an effort to reach the least-cost, most-value equilibrium for policy affirmation.

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\* i.e., Jobs, Shelter, Community, Transport, Nature. See "Framework for Action," October 1974, pp.15-27, and "Fiscal Impact Analysis," September 1975, pp.176-187.

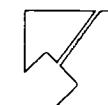
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